

CLAIMS

What is claimed is:

1. A method for inducing apoptosis in hyperproliferative human cells comprising: increasing the level in the cells of at least one potassium channel modulatory protein selected from the group consisting of human KChAP protein, a biologically active variant of human KChAP protein, and a biologically active KChAP related protein.
2. The method of claim 1 wherein levels of said protein in the cells is increased by contacting the cells with at least one protein selected from the group consisting of human KChAP protein, a biologically active variant of KChAP protein, and a biologically active KChAP related protein under conditions which permit uptake of said protein.
3. The method of claim 1 wherein levels of said protein is increased in said cells by contacting said cells with a nucleic acid encoding at least one potassium channel modulatory protein under conditions permitting uptake of said nucleic acid by the cell, said nucleic acid comprising:
 - i) a sequence encoding native KChAP protein, a biologically active variant of KChAP protein, or a biologically active KChAP related protein, and
 - ii) a promoter active in the cancer cell, wherein the promoter is operably linked to the sequence encoding said protein.
4. A method for inducing apoptosis in human cancer cells comprising: increasing the level in the cells of at least one potassium channel modulatory protein selected from the group consisting of human KChAP protein and a biologically active variant of human KChAP protein.
5. The method of claim 4 wherein levels of said protein in the cancer cells is increased by contacting the cancer cells with at least one protein selected from the group consisting of human KChAP protein, and a biologically active variant of KChAP protein.

6. The method of claim 4 wherein levels of said protein is increased in the cancer cells by contacting the cancer cells with a nucleic acid encoding at least one potassium channel modulatory protein under conditions permitting uptake of said nucleic acid by the cell, said nucleic acid comprising:

- i) a sequence encoding human KChAP protein and a biologically active variant of KChAP protein; and
- ii) a promoter active in the cancer cell, wherein the promoter is operably linked to the sequence encoding said protein.

7. The method of claim 4 wherein the cancer cells comprise a native p53 protein.

8. The method of claim 4 wherein the cancer cells comprise a mutant p53 protein.

9. The method of claim 5 wherein the cancer cells are in a tumor in a subject, and wherein the protein is administered to the subject by intratumoral or intralesional injection.

10. The method of claim 6 wherein the cancer cells are in a tumor in a subject, and wherein the nucleic acid is administered to the subject by intratumoral or intralesional injection.

11. A method of treating a subject with a hyperproliferative disorder comprising:

administering a pharmaceutical composition to said subject, said pharmaceutical composition comprising at least one agent selected from the group consisting of:

a) at least one potassium channel modulatory protein selected from the group consisting of human KChAP protein, a biologically active variant of human KChAP protein, and a biologically active KChAP related protein; and

b) a nucleic acid encoding at least one potassium channel modulatory protein, comprising:

- i) a sequence encoding human KChAP protein, a biologically active variant of human KChAP protein, or a biologically active KChAP related protein, and
- ii) a promoter active in the cancer cell, wherein the promoter is operably linked to the sequence encoding said protein.

12. The method of claim 11 wherein the hyperproliferative disorder is a cancer.
13. The method of claim 11 wherein the hyperproliferative disorder is an epithelial carcinoma, a lymphoma, or a leukemia.
14. The method of claim 11 wherein the hyperproliferative disorder is prostate cancer.
15. The method of claim 12 wherein the pharmaceutical composition comprises a nucleic acid comprising a sequence encoding human KChAP protein or a biologically active variant of human KChAP protein, wherein said variant comprises a sequence which is at least 90% identical to human KChAP protein and has the ability to induce apoptosis in the cells of said cancer.
16. The method of claim 12 wherein the active agent is a human KChAP protein or a biologically active variant of human KChAP protein, wherein said variant comprises a sequence which is at least 90% identical to human KChAP protein and has the ability to induce apoptosis in the cells of said cancer.
17. The method of claim 12 wherein the active agent is a nucleic acid which is in a vector or associated with a liposome.
18. The method of claim 17 wherein the pharmaceutical composition is administered by intratumoral or intralesional injection.
19. The method of claim 12 wherein the active agent is a protein and the pharmaceutical composition is administered by intratumoral or intralesional injection.
20. A method of detecting cancer cells in a test sample, said sample comprising cells selected from the group consisting of liver tissue cells, brain tissue cells, colon tissue cells, and rectal tissue cells, said method comprising:

assaying for an increase in the intracellular levels of KChAP protein or a KChAP mRNA in said test sample.

21. The method of claim 20 wherein the method comprises:

a) contacting said cells or a protein extract therefrom with anti-KChAP antibodies under conditions wherein binding said antibodies to KChAP protein occurs ; and

b) assaying for a complex between said antibodies and a protein in said cells or said extract,

wherein an increase in the level of the antigen-antibody complexes in the cells or protein extract of said test sample as compared to the level of the antigen-antibody complexes in the cells or protein extract of a corresponding control sample, indicates that the test sample contains or was derived from cancerous cells.

22. The method of claim 20 wherein the method comprises assaying for KChAP mRNA in said sample, wherein an increase in the level of KChAP mRNA in said test sample as compared to the level of KChAP mRNA in a corresponding control sample, indicates that the test sample contains or was derived from cancerous cells.

23. A method of inhibiting cell cycling in cancer cells that contain a wild-type p53 protein, comprising: contacting the cancer cells with a nucleic acid encoding at least one potassium channel modulatory under conditions permitting uptake of said nucleic acid by the cell, said nucleic acid comprising:

- i) a sequence encoding human KChAP protein and a biologically active variant of KChAP protein; and
- ii) a promoter active in the cancer cell, wherein the promoter is operably linked to the sequence encoding said protein.